

# 5.6 Practice A

In Exercises 1–3, solve  $y = f(x)$  for  $x$ . Then find the input(s) when the output is  $-3$ .

1.  $f(x) = 2x + 3$

2.  $f(x) = \frac{1}{3}x - 2$

3.  $f(x) = 8x^3$

In Exercises 4–6, find the inverse of the function. Then graph the function and its inverse.

4.  $f(x) = 4x$

5.  $f(x) = 4x - 1$

6.  $f(x) = \frac{1}{2}x - 5$

7. Find the inverse of the function  $f(x) = \frac{1}{5}x - 2$  by switching the roles of  $x$  and  $y$  and solving for  $y$ . Then find the inverse of the function  $f$  by using inverse operations in the reverse order. Which method do you prefer? Explain.

8. Determine whether each pair of functions  $f$  and  $g$  are inverses. Explain your reasoning.

a.

$x$	-2	-1	0	1	2
$f(x)$	-3	3	9	15	21

$x$	-3	3	0	15	21
$g(x)$	-2	-1	0	1	2

b.

$x$	1	2	3	4	5
$f(x)$	9	7	5	3	1

$x$	9	7	5	3	1
$g(x)$	1	2	3	4	5

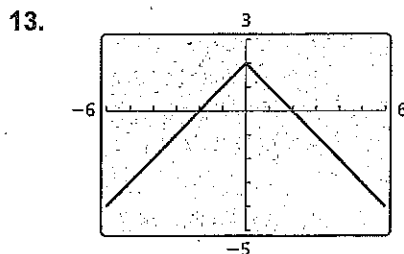
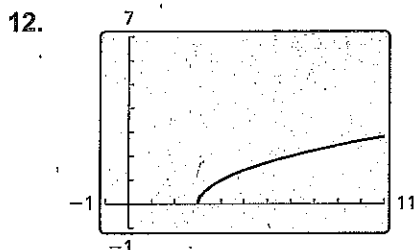
In Exercises 9–11, find the inverse of the function. Then graph the function and its inverse.

9.  $f(x) = 9x^2, x \geq 0$

10.  $f(x) = 16x^2, x \leq 0$

11.  $f(x) = (x + 2)^3$

In Exercises 12 and 13, use the graph to determine whether the inverse of  $f$  is a function. Explain your reasoning.



**5.6 Practice B**

In Exercises 1–3, solve  $y = f(x)$  for  $x$ . Then find the input(s) when the output is  $-3$ .

1.  $f(x) = -\frac{4}{3}x + 2$

2.  $f(x) = 25x^4$

3.  $f(x) = (x - 3)^2 - 4$

In Exercises 4–6, find the inverse of the function. Then graph the function and its inverse.

4.  $f(x) = -3x + 4$

5.  $f(x) = -\frac{1}{3}x + 1$

6.  $f(x) = \frac{2}{5}x - \frac{1}{5}$

7. Describe and correct the error in finding the inverse function.

$$\begin{aligned} \times \quad f(x) &= 3x - 8 \\ y &= 3x - 8 \\ x &= 3y - 8 \\ g(x) &= 3x - 8 \end{aligned}$$

In Exercises 8–10, find the inverse function. Then graph the function and its inverse.

8.  $f(x) = -9x^2, x \leq 0$

9.  $f(x) = (x - 1)^3$

10.  $f(x) = x^6, x \leq 0$

11. Find the inverse of the function  $f(x) = 8x^3$  by switching the roles of  $x$  and  $y$  and solving for  $y$ . Then find the inverse of the function  $f$  by using inverse operations in the reverse order. Which method do you prefer? Explain.

In Exercises 12–15, determine whether the functions are inverses.

12.  $f(x) = 6x + 1; g(x) = 6x - 1$

13.  $f(x) = \frac{\sqrt[3]{x-6}}{2}; g(x) = 8x^3 + 6$

14.  $f(x) = \frac{5-x}{2}; g(x) = 5 - 2x$

15.  $f(x) = 4x^2 + 3; g(x) = -\frac{x-3}{4}$

16. The volume of a sphere is given by  $V = \frac{4}{3}\pi r^3$ , where  $r$  is the radius.

- Find the inverse function. Describe what it represents.
- Find the radius of a sphere with a volume of 146 cubic meters.